



*Region 6: San Jacinto
Flood Planning Group*

April 8, 2021

9:00 am

Virtual Meeting



Item 1: Call to Order



Item 2:

Welcome and Roll Call



Item 3:

Texas Water Development Board
Update



Item 4:

Registered Public Comments on
Agenda Items 5-19
(limit of 3 minutes per person)



Item 5:

Approval of minutes from the
March 11, 2021 SJRFPG Meeting

Meeting Minutes
Region 6 San Jacinto Regional Flood Planning Group Meeting
March 11, 2021
9:00AM
CISCO WebEx Virtual Meeting

Roll Call:

Voting Member	Interest Category	Present (x) / Absent () / Alternate Present (*)
Russ A. Poppe	<i>Chair, Flood Districts</i>	X
Alia Vinson	<i>Vice Chair, Water Districts</i>	X
Alisa Max	<i>Secretary, Counties</i>	X
Gene Fisseler	<i>At-Large, Public</i>	X
Matthew Barrett	<i>At-Large, River Authorities</i>	X
Elisa Macia Donovan	<i>Agricultural Interests</i>	X
Jenna Armstrong	<i>Small Business</i>	X
Paul E. Lock	<i>Electric Generating Utilities</i>	X
Sarah P. Bernhardt	<i>Environmental Interests</i>	X
Stephen Costello	<i>Municipalities</i>	X
Timothy E. Buscha	<i>Industries</i>	X
Todd Burrer	<i>Water utilities</i>	X

Non-voting Member	Agency	Present(x)/Absent() / Alternate Present (*)
Adam Terry	Texas Parks and Wildlife Department	
Natalie Johnson	Texas Division of Emergency Management	
Kristin Lambrecht	Texas Department of Agriculture	X
Joel Clark	Texas State Soil and Water Conservation Board	X
Ellen Kinsey	General Land Office	X
Megan Ingram	Texas Water Development Board	X
Kelly Mills	Texas Commission on Environmental Quality	X
Jeff Taebel	Houston-Galveston Area Council	X
Ellie Alkhoury	Texas Department of Transportation	X
Tom Heidt	Port Houston	X
Michael Turco	Harris-Galveston Subsidence District	X

Quorum:

Quorum: **Yes**

Number of voting members or alternates that were present: 12

Number required for quorum per current voting membership of 12: 7

Aaron Tuley
 Alfred Garcia

Ashley Poe
 Bob Lux

Brandon Wade
Brooke Bacuetes
Chuntania Dangerfield
Clarissa Perez
Cory Stull
Danielle Goshen
Dr. Shelley Sekula-Gibbs
Erin Kinney
Fatima Berrios
Glenna Sloan
Hector Olmos
James Bronikowski
Jill Boullion
John Yoars
Justin Bower
Kena Ware
Krista Melnar
Laura Atlas
Laura Norton
Maggie Puckett
Mark Unland
Mark Vogler
Marlisa Briggs
Matt Lopez
Michael Bloom

Michael Keck
Michael Reedy
Morgan White
Natalie Ballew
Neil Gaynor
Pam Hawkins
Penny Bradshaw
Philip Berzins
Rebecca Andrews
Reem Zoun
Reid Mrsny
Robert Kosar
Sally Bakko
Shea Sullivan
Stephanie Griffin
Stephanie Ruediger
Stephanie Zertuche
Susan Chadwick
Terry Barr
Tiffany Cartwright
Todd Stephens
Tommy Ramsey
Vince DeCapio
Unknown Caller: 3

**Meeting attendee names were gathered from those who entered information on the GoToWebinar meeting.

All meeting materials were available for the public at:
<http://www.twdb.texas.gov/flood/planning/regions/schedule.asp>.

AGENDA ITEM NO. 1: Call to Order

Mr. Poppe, Chair of the SJRFPG, called the meeting to order at 9:00 AM and welcomed all attendees.

AGENDA ITEM NO. 2: Welcome and Roll Call

Ms. Max, Secretary of the SJRFPG, took roll call and a quorum was established.

AGENDA ITEM NO. 3: Texas Water Development Board Update

Morgan White, on behalf of the Texas Water Development Board, gave a brief update stating that TWDB had begun processing grant fund applications, and anticipates having all contracts with planning group sponsors executed by March 31st. Ms. White also stated TWDB has been working with the Regional Flood Planning Groups on setting up their websites, and preparing for the required pre-planning public meetings.

AGENDA ITEM NO. 4: Registered Public Comments on Agenda Items 5-17 (limit of 3 minutes per person)

No written comments were received. The verbal comments given during the meeting are as follows:

- a) John Yoars, Agenda Item 8 – Mr. Yoars expressed his support for Neil Gaynor as a representative for the Montgomery County area.
- b) Neil Gaynor, One Water Task Force, Agenda Item 8 – Mr. Gaynor highlighted the importance of flood and water planning within the upper watershed area within the San Jacinto Region.
- c) Laura Norton, MUD 47 and Woodlands Water Board of Trustees, Item 8 – Ms. Norton stated her concern and disappointment with the lack of representation in the upper watershed area of Region 6.
- d) Penny Bradshaw, Interested Resident, Agenda Item 8 – Ms. Bradshaw stated her concern pertaining to the lack of representation for the Upper Watershed and recommended the SJRFPG add an additional seat to represent the upper watershed area. She recommended Neil Gaynor for that position.
- e) Glenna Sloan, Interested Resident, Agenda Item 8 – Ms. Sloan expressed her concern for repeated flooding in the upper watershed area and recommended Neil Gaynor as the upper watershed area representative.
- f) Robert Lux, President of MUD 60, Agenda Item 8 – Mr. Lux requested an additional voting seat for representation of the upper watershed area.

AGENDA ITEM NO. 5: Approval of minutes from the February 11, 2020 SJRFPG Meeting

Ms. Vinson moved to approve the meeting minutes with the minor correction of having Jeff Taebel shown as present during the meeting. Ms. Max seconded the motion, which carried unanimously.

AGENDA ITEM NO. 6: Announcement of new Alternate Members and new Non-Voting Members

Ms. Max announced that there were two new voting member alternates. She announced Mark Yetzen as Todd Burren's alternate and Jill Boullion as Sarah Bernhardt's alternate.

AGENDA ITEM NO. 7: Update from Executive Committee, discussion, and possible action on Liaison to the neighboring Region 8 Lower Brazos Regional Flood Planning Group

Mr. Poppe opened the floor to the SJRFPG members for any recommendations or possible volunteers to serve as a liaison. Ms. Vinson asked if Mr. Turco was still willing to serve as the Region 8 liaison, and Mr. Turco replied affirmatively. Ms. Vinson moved to have Mr. Turco serve as the liaison to Region 8, Ms. Armstrong seconded the motion, which carried unanimously.

AGENDA ITEM NO. 8: Discussion and possible action on Regional Flood Planning Group Membership, including the consideration of the addition of new voting and non-voting members/ member categories and update on current solicitation efforts for new members in categories already approved

Ms. Berrios provided an update on the solicitation process for candidates for the Coastal Communities and Public Categories. Ms. Berrios stated that only two applications had been received and reminded all the attendees that the deadline for submitting an application is March 26, 2021.

Ms. Vinson asked for clarification as to when the applications would be received by the SJRFPG members, and asked if there would be an Executive Committee meeting held before the SJRFPG meeting. Ms. Berrios stated she would distribute the applications before the next SJRFPG meeting. Discussion ensued.

After further discussion, Mr. Barrett redirected the discussion to the Upper Watershed representation topic. Many SJRFPG members stated their support of the creation of the category and there was discussion on which areas would be included in the new "Upper Watershed" area. Ms. Armstrong moved to create a voting member category for Upper Watershed, defined as areas upstream of the Lake Houston dam, Mr. Barrett seconded the motion, which passed unanimously.

Mr. Poppe opened discussion for the creation of the solicitation notice for the Upper Watershed Category. Ms. Vinson asked if the same process would be followed as the previous solicitation notices. The group, by consensus, decided that the Planning Group Sponsor would draft and distribute the solicitation notice without further action from the SJRFPG or Executive Committee members.

AGENDA ITEM NO. 9: Discussion and possible action pertaining to the development of a new Region 6 -SJRFPG Website

Mr. Poppe opened the conversation by stating that approximately half of the other regional flood planning groups had websites up and running. Mr. Poppe stated Harris County Flood Control District Communications could help the SJRFPG create the website with an anticipated cost of \$800. Mr. Costello asked if Harris County Flood Control District would be reimbursed for the website. Ms. White replied yes but that she would verify with her managers.

Ms. Max stated that the grant application has roughly \$3000 for miscellaneous expenses such as this, but reminded the SJRFPG that the consultant could also create the website. Ms. Bernhardt asked for clarification regarding the motivation for establishing the website up before the consultant was on board. Ms. Max stated that the website could be valuable in that it would limit the posting deadline requirements, and would make it easier to gather public comments and communicate better with the public. Mr. Poppe then stated that the consultant would also need additional time to establish the website, and anticipated that the website established by the consultant would not be ready for use until late July. Opposed to if Harris County set up the website with a use date of early May.

Discussion ensued. After deliberation, no action was taken and Mr. Poppe stated that the SJRFPG would continue to coordinate with the TWDB for posting requirements.

Mr. Poppe gave a 10-minute recess at 10:35 AM and called the meeting back into session at 10:45 AM.

AGENDA ITEM NO. 10. Discussion and possible action concerning public engagement strategies including organizing and setting a future date for a public meeting as required by Texas Water Code §16.062(d) and 31 Texas Administrative Code §361.12(a)(4):

Mr. Poppe summarized the previous discussion on this item and reminded the SJRFPG that the pre-planning meeting is required. He stated that the SJRFPG could wait to hold the pre-planning meeting until the consultant is hired or it could be scheduled as soon as possible. Mr. Poppe stated that the virtual platform Harris County Flood Control Districts currently uses is called "Public Input," and indicated it could be used for the pre-planning meeting. Mr. Poppe then stated that the soonest HCFCD could schedule the meeting was in a month and a half, so in mid-April. Ms. Vinson moved to authorize the scheduling of a pre-planning meeting in accordance with the Texas Administrative Code and Texas Water Code at a time that the consultant could attend, to be conducted by Harris County Flood Control Districts would hold. Mr. Fisseler seconded the motion, which carried unanimously.

AGENDA ITEM NO. 11: Discussion and update to the SJRFPG concerning tracking of public engagement and speaker requests on behalf of the SJRFPG and development of media request guidance

Ms. Berrios, on behalf of the Planning Group Sponsor, summarized that both Harris County staff and Harris County Flood Control District staff are coordinating to draft a media guidance document for the SJRFPG members to use, and reported that the Harris County Flood Control Communications Team recommended that one person be designated for all news media requests.

Ms. Berrios then presented a public engagement tracking form that would be used by SJRFPG members when requested to present in their official capacities. She then reminded everyone that the requests would need to be approved by either the Chair or Vice Chair. Ms. Berrios also stated that the Harris County staff had created a PowerPoint presentation that the SJRFPG speakers could use in the future.

Ms. Bernhardt then asked about how social media would be tracked. Ms. Max stated that social media had not previously been discussed, but stated that it would be a topic that would need to be addressed as the SJRFPG continued to operate and the consultant was hired.

Ms. Armstrong then asked for clarification on the designated media speaker, and Ms. Berrios clarified this individual, who has not yet been designated, would address news media requests, or other formal public speaking requests. Ms. Vinson then asked if the media policy guidance document would be forthcoming, and Ms. Berrios replied that Harris County and Harris County Flood Control District staff would be coordinating to create a draft in time for the next Executive Committee meeting and SJRFPG meeting. No action was taken on this agenda item.

AGENDA ITEM NO. 12: Update, discussion, and possible action concerning technical consultant procurement and grant status from TWDB, and/or Planning Group Sponsor

Mr. Mrsny reported that the Planning Group Sponsor was on schedule to execute all deadlines as shown in the tentative schedule. He then provided some important dates as follows:

- February 12, 2021: Request for Qualifications (RFQ) posted on Civcast
- March 3, 2021: Pre-Submittal Conference
- March 15, 2021: Deadline for RFQ submittals
- March 25, 2021: Evaluation Committee Meeting to discuss applicants
- April 1 & April 5, 2021: Interviews
- April 13, 2021: Commissioners Court Approval to allow Planning Group Sponsor to negotiate with the selected consultant

Mr. Mrsny stated that Commissioners Court approval would be needed on April 13th if the SJRFPG is to remain on schedule. He then stated an additional SJRFPG meeting would be required to approve the selected firm after April 13th in order to allow the Planning Group Sponsor to begin to negotiate a contract. Mr. Poppe then verified that only seven-day notice would be required if the SJRFPG wants to schedule an additional meeting to discuss and approve the selection of the consultant. Discussion ensued. No action was taken, but it was determined that the additional meeting would be scheduled tentatively around April 15, 2021.

AGENDA ITEM NO. 13: Update and discussion from the Planning Group Sponsor regarding project schedule and budget.

Ms. Max gave a brief overview of the grant application status stating the Planning Group Sponsor was on schedule to execute the grant contract by the end of March 2021.

AGENDA ITEM NO. 14: Update from Liaisons pertaining to other region progress and status updates

- a) **Trinity Region**- Mr. Burrer stated that the meeting was cancelled due to inclement weather and was rescheduled for next week, March 16th.
- b) **Neches Region** – Mr. Buscha stated that the regional flood planning group shortlisted three consultant firms, and had selected Freese Nichols & HDR team to develop its regional flood plan, and had moved into negotiations. He also stated that it has not identified a Trinity or Sabine liaison, and had selected a website domain as <http://nechesfloodplanning.org/>.
- c) **Lower Brazos Region** – Mr. Vogler reported no new information at this time.
- d) **Region H Water** – No liaison has been identified at this time and no update was available.

AGENDA ITEM NO. 15: Texas General Land Office (GLO) Presentation – GLO Combined River Basin Flood Study Overview

GLO gave a presentation which highlighted its proposed projects and flood study analysis which overlapped with the scope of work and timeline given to all the Regional Flood Planning Groups by TWDB. During the presentation, GLO stated it would be happy to provide its data collection and gap analysis to the regional flood planning groups. At the end of the presentation, Ms. Ellen Kinsey was named as the contact for additional concerns.

Mr. Costello asked if there were significant overlap between SJRFPG and GLO efforts as he was concerned about duplicate efforts. Ms. Kinsey stated that the GLO was coordinating with TWDB and The U.S. Army Corp of Engineers (USACE) very closely to avoid duplicating efforts. Ms. White then stated that TWDB expects Regional Flood Planning Groups to use data collected by GLO where applicable.

Ms. Max also expressed her concerns and stated that within the grant contract between HCED and TWDB, it explicitly defined redundant work as being non-reimbursable. Mr. Costello concurred with Ms. Max and stated TWDB should meet with GLO and the Regional Flood Planning Groups to determine if duplicated efforts were defined in the RFPG scope of work. Ms. White stated that the efforts made by GLO were intended to be supplemental to the regional efforts, and each region had the discretion to use the “best available data” to develop their flood plans. Discussion ensued.

Mr. Poppe suggested that the consultant could move forward, but avoid proceeding with potential duplicate work. Mr. Poppe also suggested that a subcommittee would be beneficial to help coordinate with the GLO and TWDB.

Mr. Fisseler then stated that from a public viewpoint, the projects can become confusing and the scopes may blur with one another, so he suggested both scopes be clearly delineated.

AGENDA ITEM NO. 16: Presentation of 2021 Planning Group key dates and deadlines

- a) **Upcoming planning schedule milestones**
- b) **The next San Jacinto RFPG meeting will be on April 8, 2021 at 9:00 am.**

Key dates and deadlines: Next meeting will be April 8th. Ms. Max suggested the potential Executive Committee meeting could be held on April 6th.

AGENDA ITEM NO. 17: Reminder regarding Planning Group member training on Public Information Act and Open Meetings Act

Mr. Poppe gave a reminder that all members, including alternates, needed to complete the Public Information Act and Open Meetings Act training as soon as possible.

AGENDA ITEM NO. 18: Consider agenda items for next meeting

- Presentation from the Texas Living Waters Project
- Update on Pre-Planning Public Meeting and scheduling
- Update on grant and technical procurement of RFQ
- Update to GLO/TWDB issue
- Update and status of new Voting Category – Upper Watershed
- Update from Executive Committee meeting for recommendations for new voting member for both the Public Category and Coastal Communities Category
- Update and discussion on the logistics of in-person meetings
- Update and discussion regarding future TWDB/GLO/SJRFPG collaboration

AGENDA ITEM NO. 19: Public comments – limit 3 minutes per person

Item 19: Dr. Shelly Sekula-Gibbs from One Water Task Force. Dr. Shelly stated she was very grateful that the group had decided to add the new Upper Watershed category.

AGENDA ITEM NO. 20: Meeting Adjourn

Mr. Poppe adjourned the meeting at 12:08 PM.

Alisa Max, Secretary

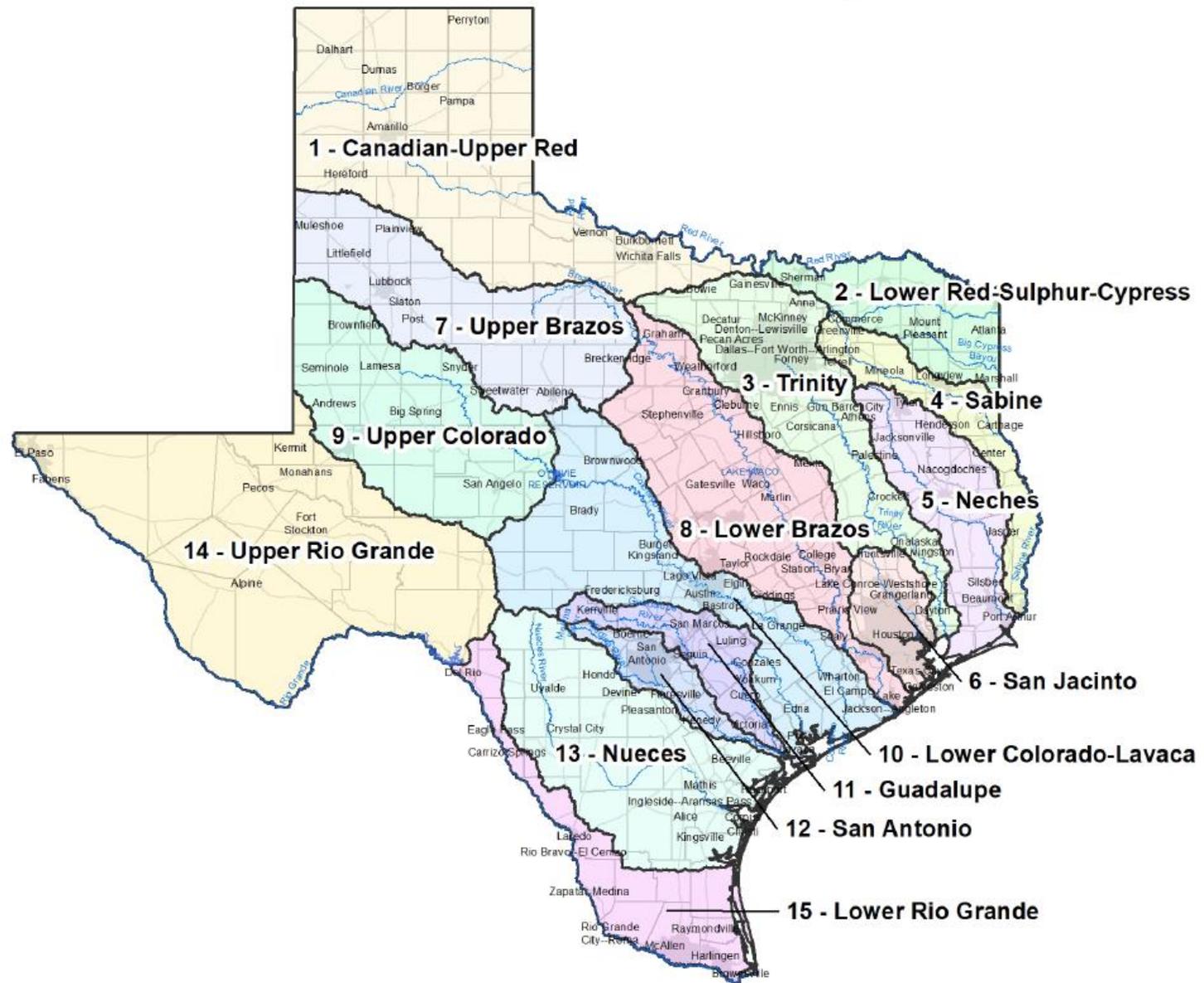
Russ Poppe, Chair



Item 6:

Announcement of new Alternate Members and new Non-Voting Members

Flood Planning Region Boundaries

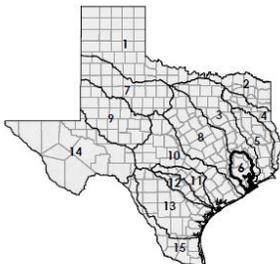
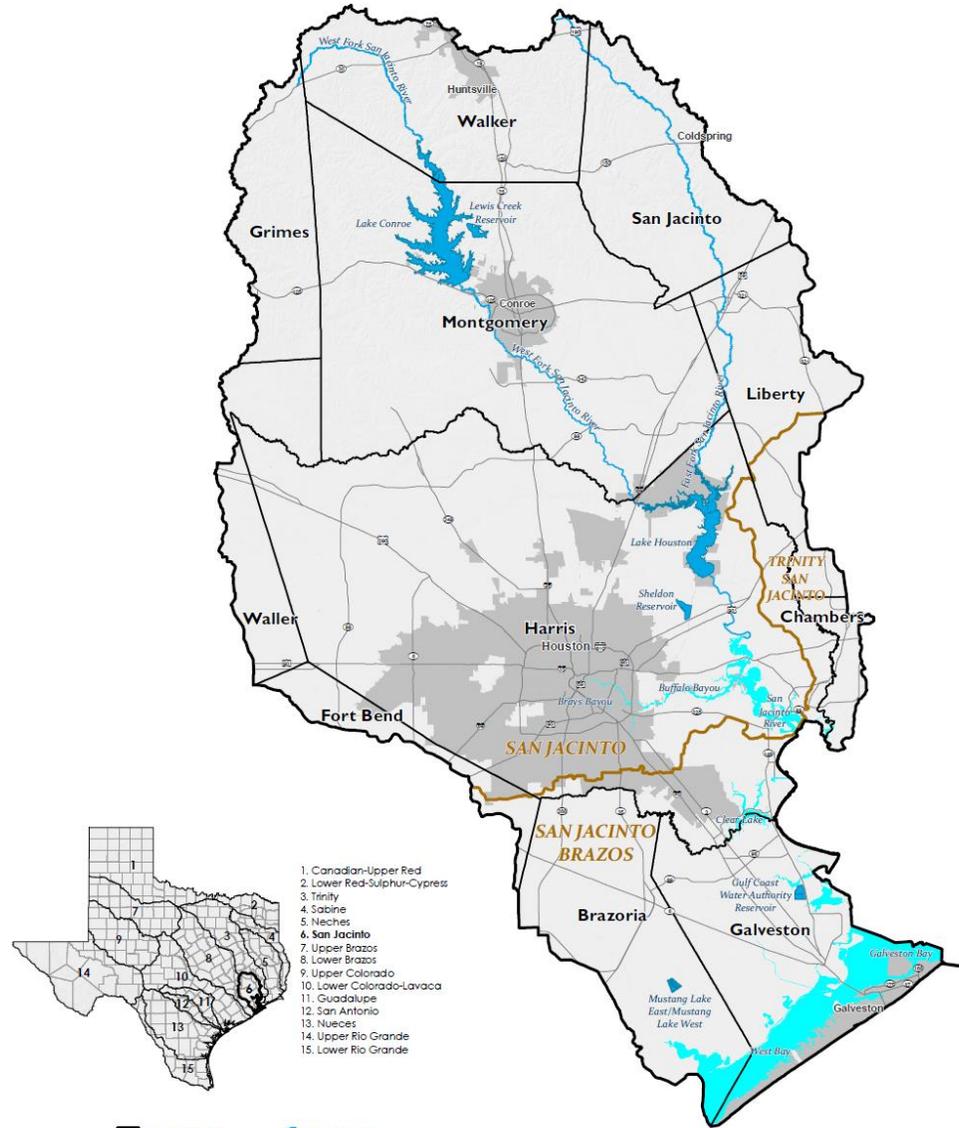


Legend

- Major Roadways
- Major Rivers
- Major Reservoirs
- Flood Planning Region Boundaries
- Canadian-Upper Red
- Guadalupe
- Lower Brazos
- Lower Colorado-Lavaca
- Lower Red-Sulphur-Cypress
- Lower Rio Grande
- Neches
- Nueces
- Sabine
- San Antonio
- San Jacinto
- Trinity
- Upper Brazos
- Upper Colorado
- Upper Rio Grande
- County Boundaries
- Urbanized Areas



Flood Planning Region - 6 - San Jacinto



1. Canadian-Upper Red
2. Lower Red-Sulphur-Cypress
3. Trinity
4. Sabine
5. Neches
6. San Jacinto
7. Upper Brazos
8. Lower Brazos
9. Upper Colorado
10. Lower Colorado-Lavaca
11. Guadalupe
12. San Antonio
13. Nueces
14. Upper Rio Grande
15. Lower Rio Grande

County boundaries
 Major river basin boundaries
 Major roadways
 Major reservoirs
 Major rivers
 County seats

DISCLAIMER: This map was generated by the Texas Water Development Board using GIS (Geographical Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitability for a particular use. The scale and location of all mapped data are approximate. Map date: 05/01/2020



Texas Water Development Board
 1700 North Congress Avenue, Austin, TX 78701
www.twdb.texas.gov @twdb - facebook.com/twdbboard





Item 7:

Update from Executive Committee,
discussion, and possible action from
Regional Flood Planning Group
Members for the Coastal
Communities and Public Categories



Item 8:

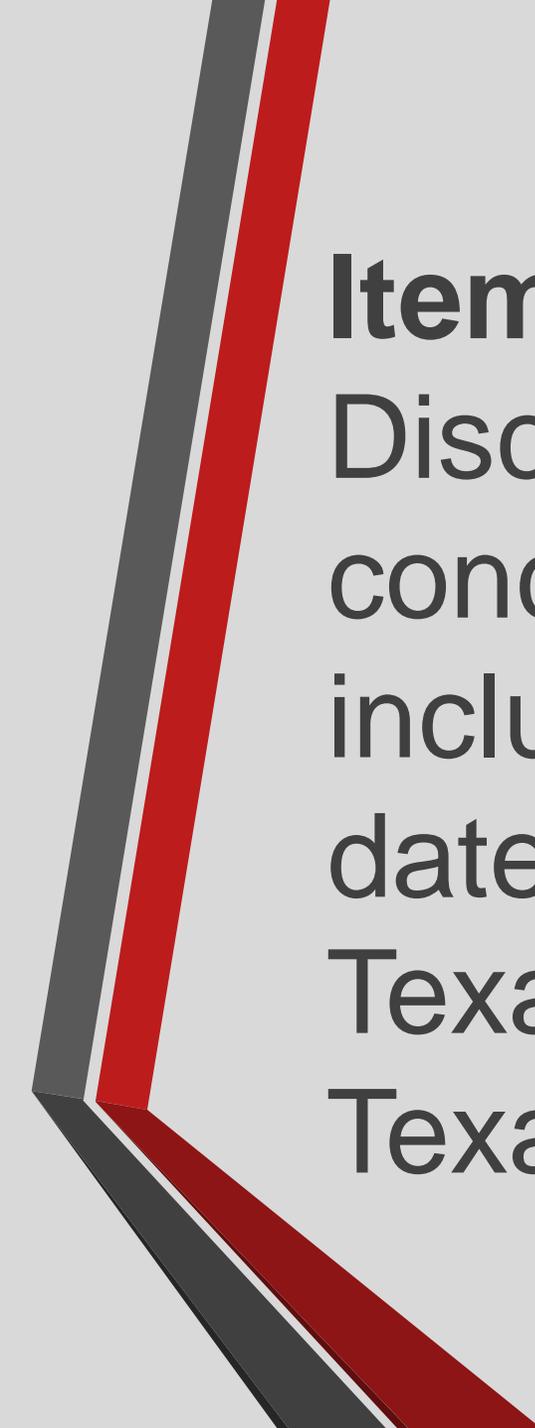
Update and discussion for the addition of new voting and non-voting members/member categories, and update on current solicitation efforts for the Upper Watershed Category.



Item 9:

Liaison Reports pertaining to other region(s) progress and status:

- a. Trinity Region
- b. Neches Region
- c. Lower Brazos Region
- d. Region H Water



Item 10:

Discussion and possible action concerning public engagement strategies including organizing and setting a future date for a public meeting as required by Texas Water Code §16.062(d) and 31 Texas Administrative Code §361.12(a)(4).



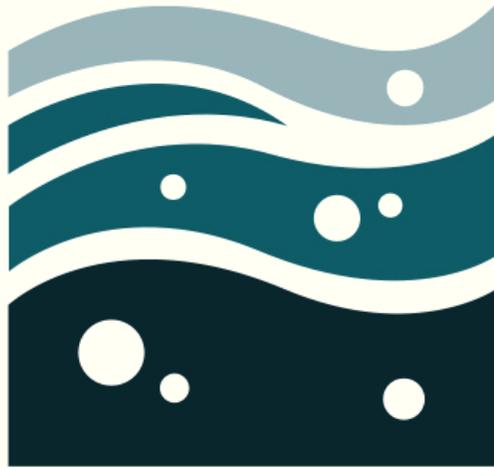
Item 11:

Update and discussion pertaining to the logistics of in-person RFPG meetings



Item 12:

Discussion and update to the SJRFPG concerning development of media request guidance including social media outreach



SAN JACINTO REGIONAL FLOOD PLANNING GROUP

R E G I O N 6

REGION 6 TEAM

Russ Poppe, Chair, Flood Control Districts Voting Member Representative

Alia Vinson, Vice Chair, Water Districts Voting Member Representative

Alisa Max, Secretary, County Voting Member Representative

Gene Fisseler, At-Large, Public Voting Member Representative

Matthew Barrett, At-Large, Rivre Authorities

Planning Group Sponsor: Harris County

Contact: SanJacFldPG@eng.hctx.net

Voting Members	Stakeholder Category
Elisa Macia Donovan	Agricultural Interests
Jenna Armstrong	Small Business
Paul E. Lock	Electric Generating Utilities
Sarah P. Bernhardt	Environmental Interests
Stephen Costello	Municipalities
Timothy E. Buscha	Industries
Todd Burrer	Water utilities



West Fork San Jacinto River near Humble, Texas after Hurricane Harvey Image: Steve Fitzgerald, Harris County Flood Control District

REGION 6- San Jacinto Regional Flood Planning Group

The SJRFPG is the second most populated flood planning region in Texas, which is home to the fourth largest city in the United States: Houston.

- **Population Estimate:** 6,297,609
- **Approximate Area:** 5,089 Square Miles
- **Approximate Stream Miles:** 3,969
- **Counties Represented:** Brazoria*, Chambers*, Ford Bend*, Galveston*, Grimes*, Harris, Liberty*, Montgomery, San Jacinto*, Walker* and Waller*

**indicates this county is partially within this RFPG and is also represented by at least one other RFPG*

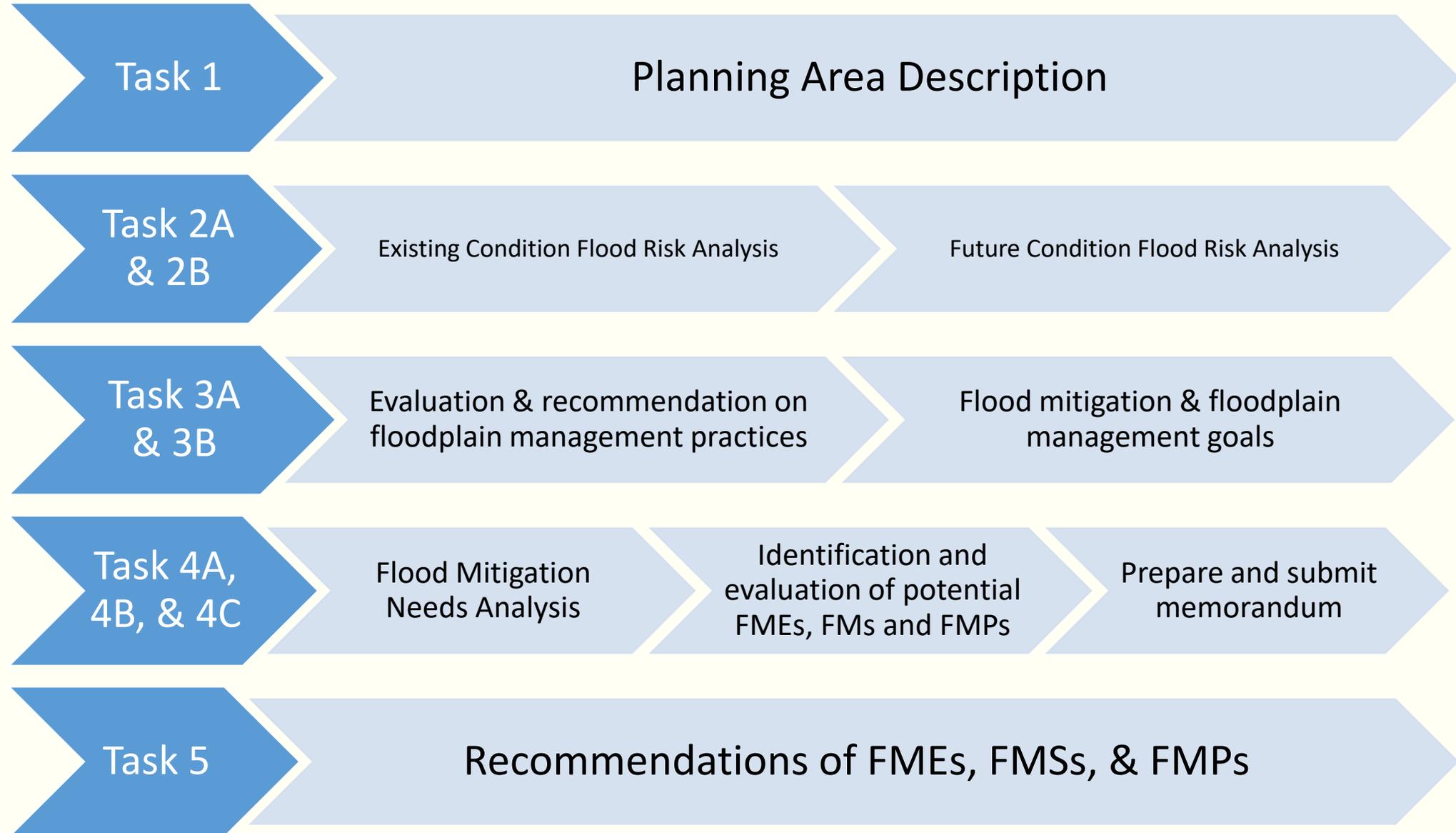
Texas Water Development Board - Regional Flood Planning Grant

The Region 6 San Jacinto RFPG was established by the TWDB on October 1, 2020 with the purpose of carrying out responsibilities placed on regional flood planning groups as required by Texas Water Code Chapter 16 and TWDB rules, including 31 Texas Administrative Code (TAC) Chapters 361 and 362.

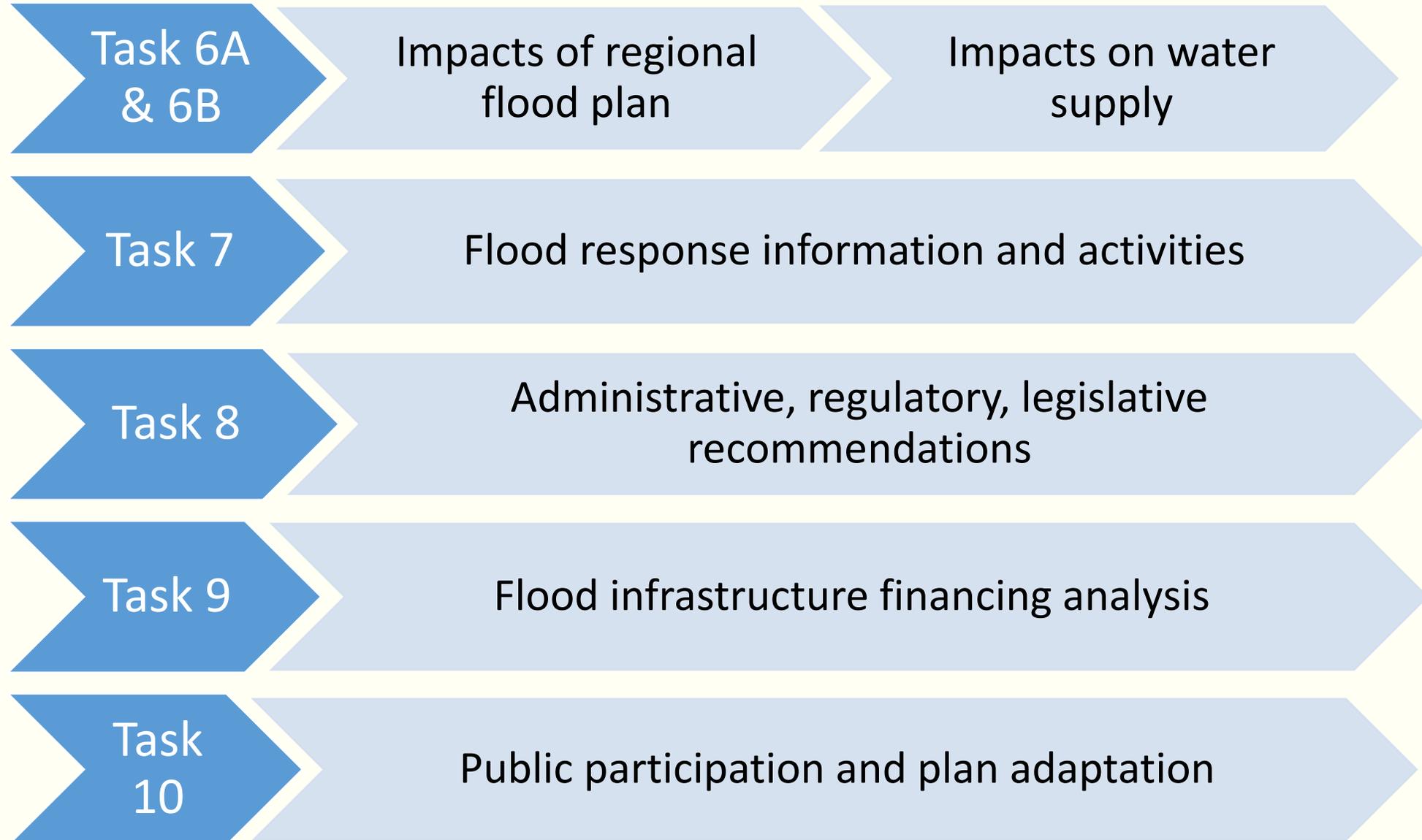
The main goals for the SJRFPG is to: identify flood risks, establish flood mitigation and floodplain management goals, and recommend evaluations, strategies, and projects to reduce flood risks.

- TWDB Grant is \$19.5 million in funds allocated between 15 regions
- Region 6 - SJRFPG is anticipated to receive \$2.4 Million

REGION 6- SJRFPG Scope of Work



REGION 6- SJRFPG Scope of Work





Item 13:

Update from Executive Committee, discussion, and possible action concerning technical consultant selection, and grant status from TWDB, and/or Planning Group Sponsor



Item 14:

Update and discussion from the Planning Group Sponsor (Harris County) regarding project schedule and budget.



Item 15:

Discussion and possible action concerning development of a coordination framework between TWDB, Region 6 RFPG and GLO regarding ongoing and parallel flood project planning efforts.



Item 16:

Presentation from the Texas Living Waters Project - Nature-Based Solutions for Flood Mitigation: An Overview for Region 6 RFPG

Nature-Based Solutions for Flood Mitigation

Overview for Region 6 RFPG



Nature-Based Flood Mitigation Infrastructure & RFPGs

RFPGs are required to *describe natural flood mitigation features* in the RFP (TAC Rule 361.31) and *shall identify and evaluate* potential FME's and *potentially feasible FMSs and FMPs, including nature-based solutions*, some of which may have already been identified by previous evaluations and analyses by others (TAC Rule 361.38).

Presentation Outline:

- Introduction to Nature-based Solutions and their importance
- Benefits for flood mitigation and additional co-benefits
- Cost effectiveness
- Case studies
- Local recommendations
- Equity considerations



What are Nature-based Solutions?

Nature-based flood mitigation includes “mitigation approaches involving the use of natural features, materials, and processes to reduce the risk and impacts of flooding” (TAC 361.10).

Inland flooding

- Floodplain and watershed restoration through levee setbacks and dam removal, wetland and forest restoration
- Green stormwater management through rain gardens and natural infiltration systems, permeable surfaces
- Protecting floodplains from development through voluntary buyouts



Coastal flooding

- Coastal habitat restoration for wetlands, beaches, dunes and barrier islands, oyster reefs
- Living shorelines using vegetation, combined vegetation and structures
- Protecting coastal areas from development



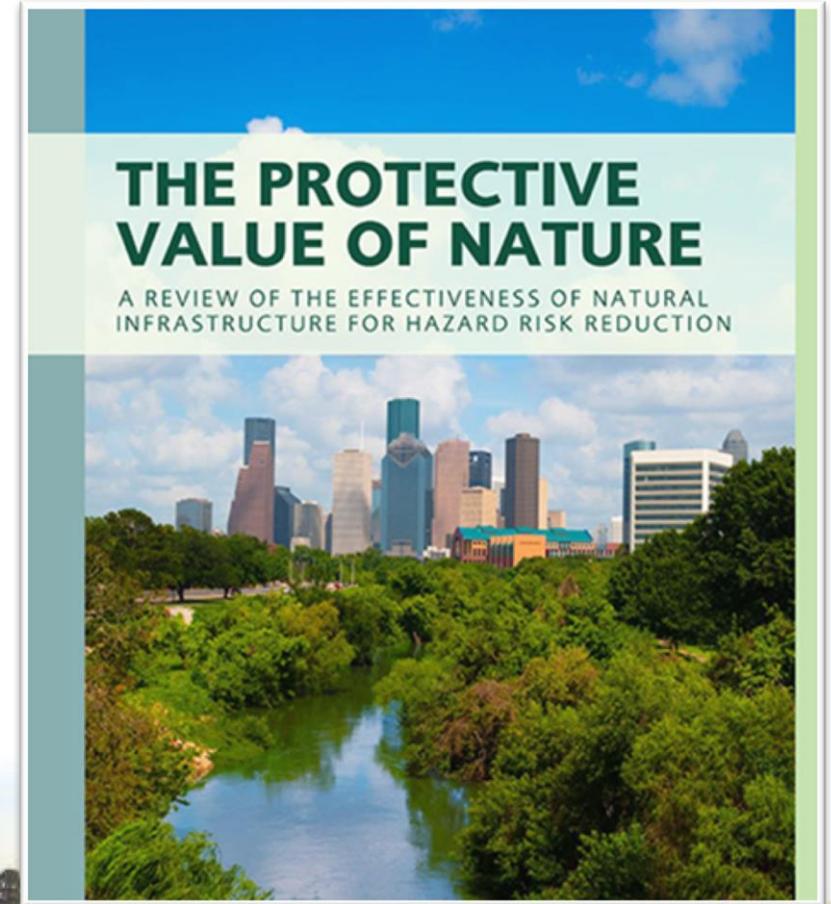
Why are Nature-based Solutions Important?

Flooding event	Current vulnerability	Future vulnerability
Extreme precipitation	2018 Independence Day flood causing damages of \$84 million in water control infrastructure	Single day events with precipitation above four inches are projected to increase
Hurricanes and tropical storms	During Hurricane Harvey, 36 to 48 inches recorded in the Houston metro area	Hurricanes like Harvey, a 100-year event for the period 1981- 2000, would become one-in-five or one-in-six year event before the end of the century
Sea level rise	Increased frequency of “nuisance” or sunny-day flooding by 5 to 10 times since the 1960s	Projected increase in nuisance flooding due to relative sea level rise and land subsidence around Houston

Benefits of Nature-based Solutions in Flood Mitigation

- Has the potential to self-recover and self-repair after storm events
- In the case of ecosystem restoration, the ecosystem grows stronger with time as it gets established
- Can keep pace with sea-level rise
- Hybrid capitalizes on best characteristics of built and natural
 - Can be used in areas where there is little space to implement natural approaches alone

Source: Sutton-Grier et al., 2015



Co-Benefits of Nature-based Solutions

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . a *description of potential . . . benefits* from the FMS or FMP to the *environment, agriculture, recreational resources, navigation, water quality, erosion, sedimentation*, and impacts to any other resources deemed relevant.”



Urban heat islands
(Willis & Petrokofsky, 2017)



Water quality
improvement (Guerrero
et al., 2020)



Human health and
societal benefits (Spano
et al., 2021)



Recreation and eco-
tourism (Bureau of
Economic Analysis, 2019)



Green economies and
jobs (Kabisch et al., 2017)

Green vs. Gray: Comparing flood mitigation benefits for coastal flooding and storm surge in the Gulf

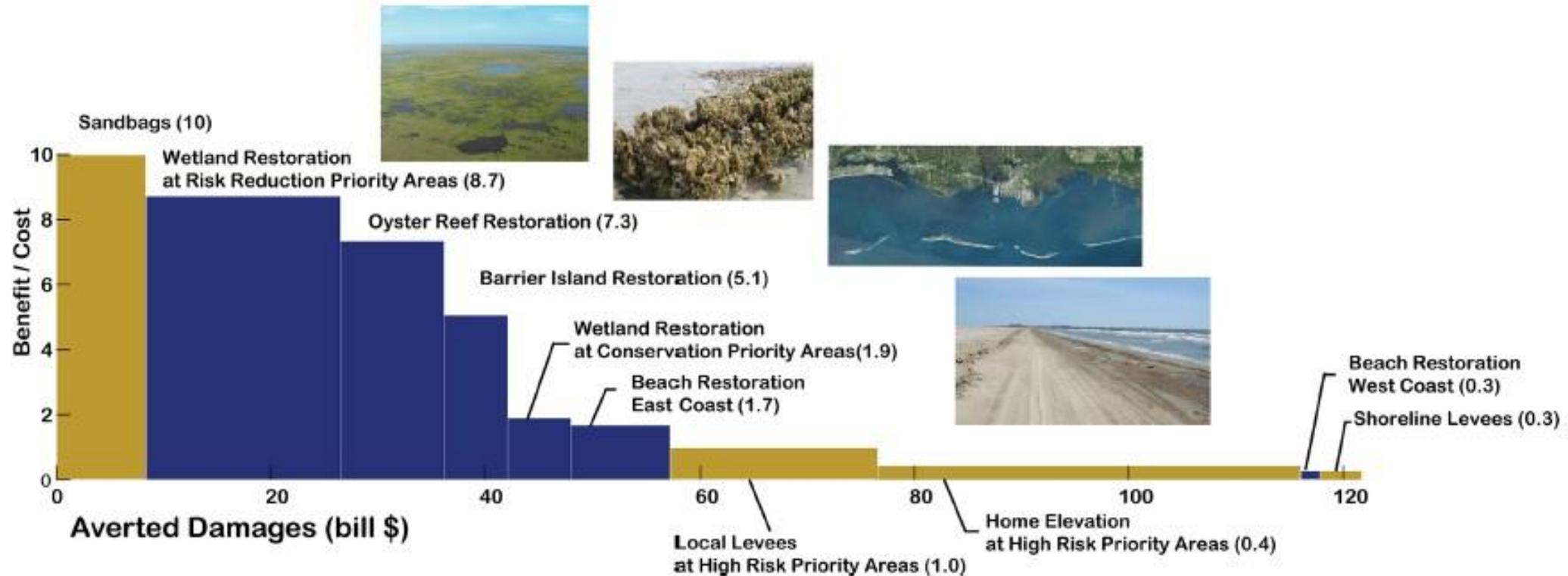
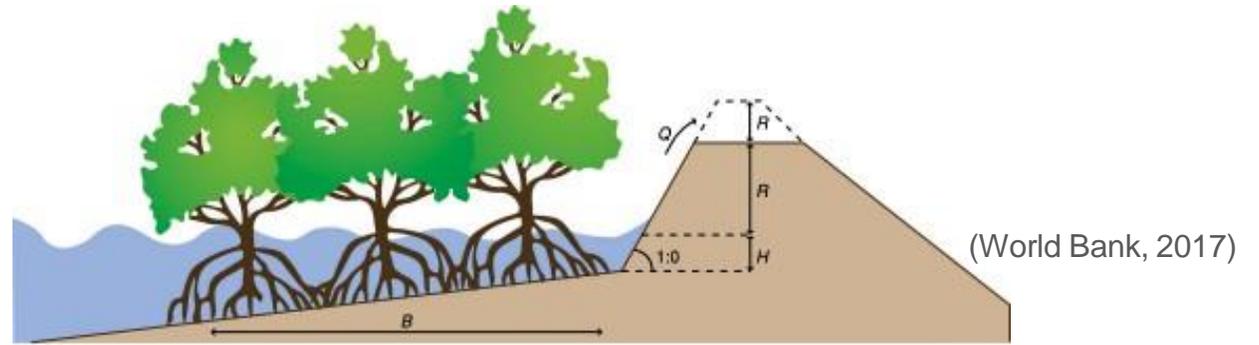


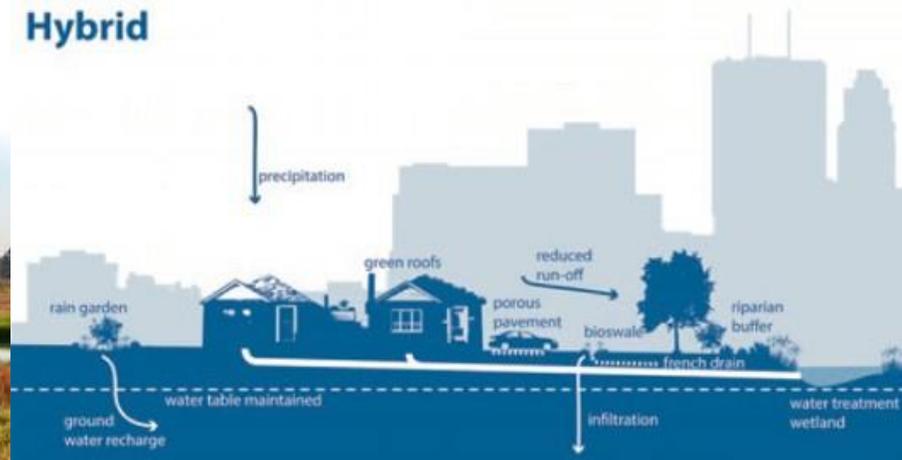
Fig 6. Cost-benefit analysis. Comparison of the costs and benefits of the adaptation measures. Benefit to cost ratios are represented in the vertical axis (height of the bars), with the horizontal axis noting the aggregated benefit (i.e. total averted damage), and the width of the bars the individual benefit from each measure. The blue bars identify nature-based adaptation measures, while the brown color represent the remaining adaptation measures. The values correspond to net present values with a 2% discount rate, for low future economic exposure growth and an implementation period of 20 years. Sources of images: flickr from U.S. Geological Survey, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, and U.S. Geological Survey LandSat imagery.

Hybrid Approach

Service	Potential Sources of Infrastructure Cost Reduction
Coastal flood management and erosion control	Natural coastal barriers such as wetlands and sandbars lower costs for gray infrastructure, such as seawalls, dikes, and groynes. <u>These barriers can reduce wave energy and the height of a storm surge, which potentially lowers the cost and/or improves resilience of built solutions.</u>
River flood management	Floodplains lower costs for gray infrastructure such as flood control embankments, sluice gates, and pumping stations. <u>The floodplains store flood waters and lower flood levels, thus potentially lowering the cost and/or improving the resilience of the built solution.</u>
Urban stormwater management	<u>Stormwater retention areas lower costs for stormwater drains, pump stations, and treatment of wastewater discharges.</u> They filter pollutants and can remove up to 90% of heavy metals from stormwater.



Yolo Bypass
(Browder et al., 2019)



(DePietri & McPhearson, 2017)

Funding Opportunities: More incentives and opportunities for nature based infrastructure

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . . an indication regarding the *potential use of federal funds*, or other sources of funding as a component of the total funding mechanism.”

Federal Funding Sources

- FEMA’s Building Resilient Infrastructures and Communities (**BRIC**) Program
- HUD’s Community Development Block Grant for Mitigation (**CDBG-MIT**) Funds
- National Resources Conservation Service's (NRCS) Emergency Watershed Protection Program (**EWPP**)*

*Note: This funding source allows the NRCS (not a local governmental entity or non profit) to purchase conservation easements

State and Local Funding Sources

- Clean Water State Revolving (**CWSRF**) Funds
 - *Green Project Reserve* available for nonpoint source protection or estuary management projects
- Flood Infrastructure Fund (**FIF**)
 - Priority points and extra grant opportunities available for nature based projects
- Harris County Flood Bond (2018)
- Hays County Parks and Open Spaces Bond (2020)

Case Study: Buffalo Bayou vs. Brays Bayou



Buffalo Bayou

- Natural Drainage and setbacks
- Remains one of few natural riparian waterways in Houston
- More successful at minimizing adverse impacts of urban development on riverine flooding over time



Brays Bayou:

- Largely channelized
- Increasingly prone to flooding

Case Study: Exploration Green

- Designed to detain and slow floodwaters and clean the runoff from **95% of the storms** that occur in the community
- Detained **100 M gallons of Harvey Stormwater** when Phase I was 80% complete
- Target storage capacity of **1,680 acre-feet**

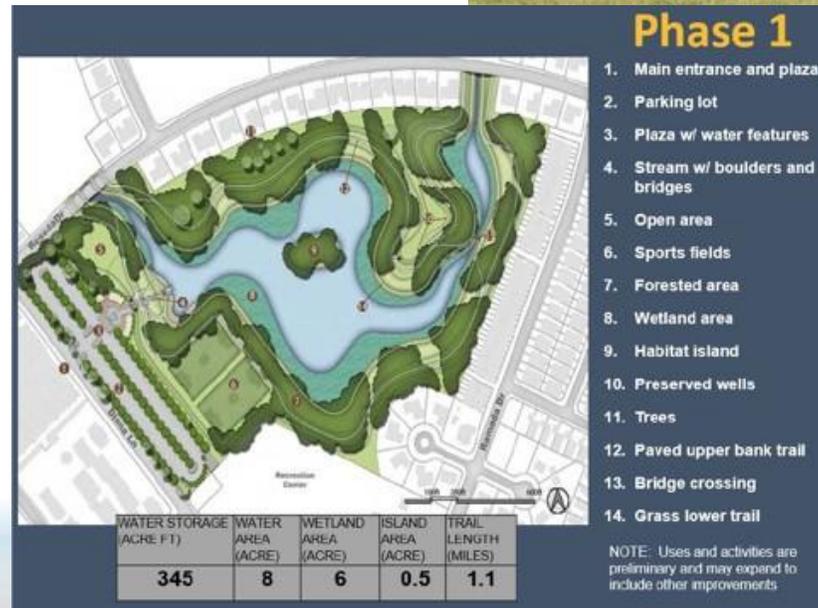


Figure 1: Aerial view of Exploration Green – artist's rendering

Case Study: Katy Prairie

Cypress Creek Overflow Management Plan (2015):

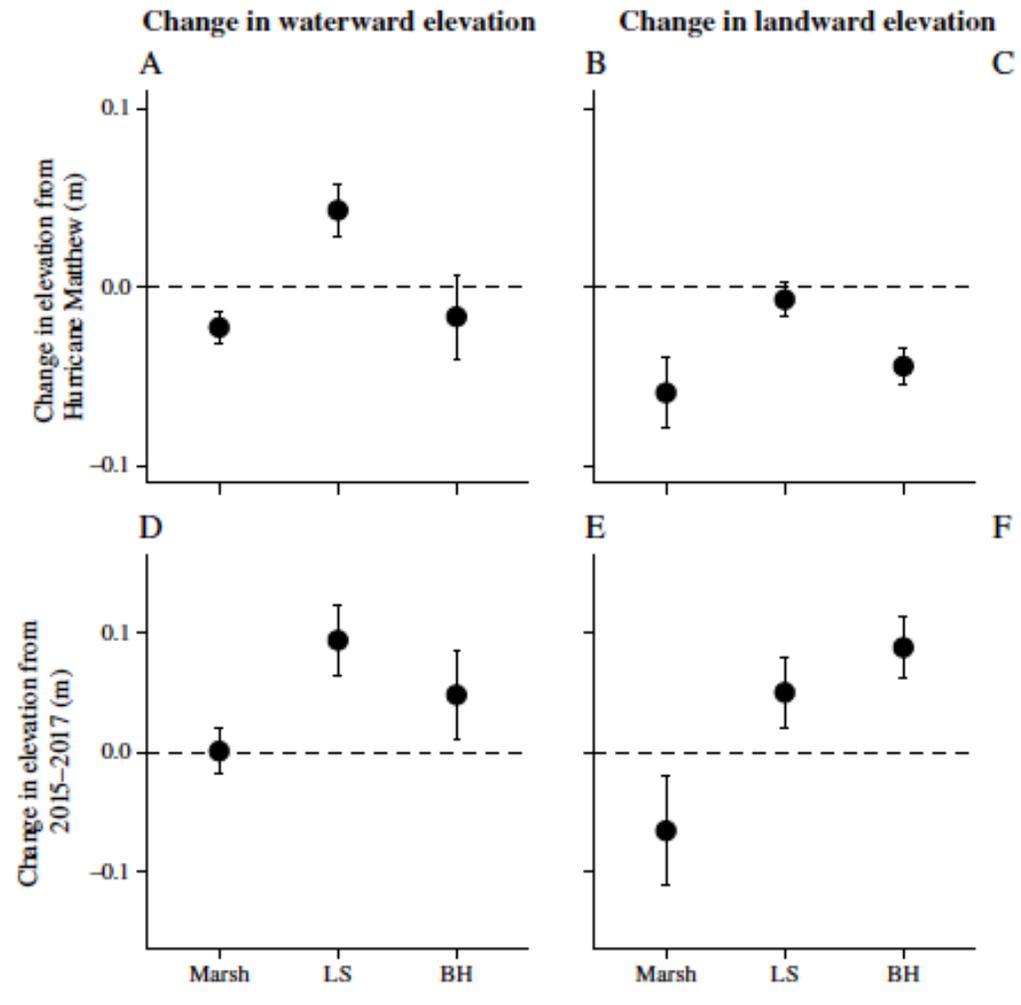
Largest flood reduction benefits come from restoration of **intermediate/low quality Coastal Prairie** or open space land cover

1 acre of prairie would increase infiltration capacity of undeveloped land by **3.52 inches in a 100-year flood event**

- Equivalent to offsetting ~2 acres of a single-family subdivision or 1 acre of commercial/retail development



Case Study: Living Shoreline Effectiveness in North Carolina



Local Recommendations for Natural Flood Mitigation

RFPs are required to *describe natural flood mitigation features* in the RFP (TAC Rule 361.31) and *shall identify and evaluate* potential FME's and *potentially feasible FMSs and FMPs, including nature-based solutions, some of which may have already been identified by previous evaluations and analyses by others* (TAC Rule 361.38).

Restore portions of the Katy Prairie that have been converted to agricultural land to increase the flood control benefit of that land – *Greater Houston Flood Mitigation Consortium*

Preserve and reclaim the floodplain and floodways for integrated flood control, recreation, natural habitat, and open space – *Houston Parks Board*

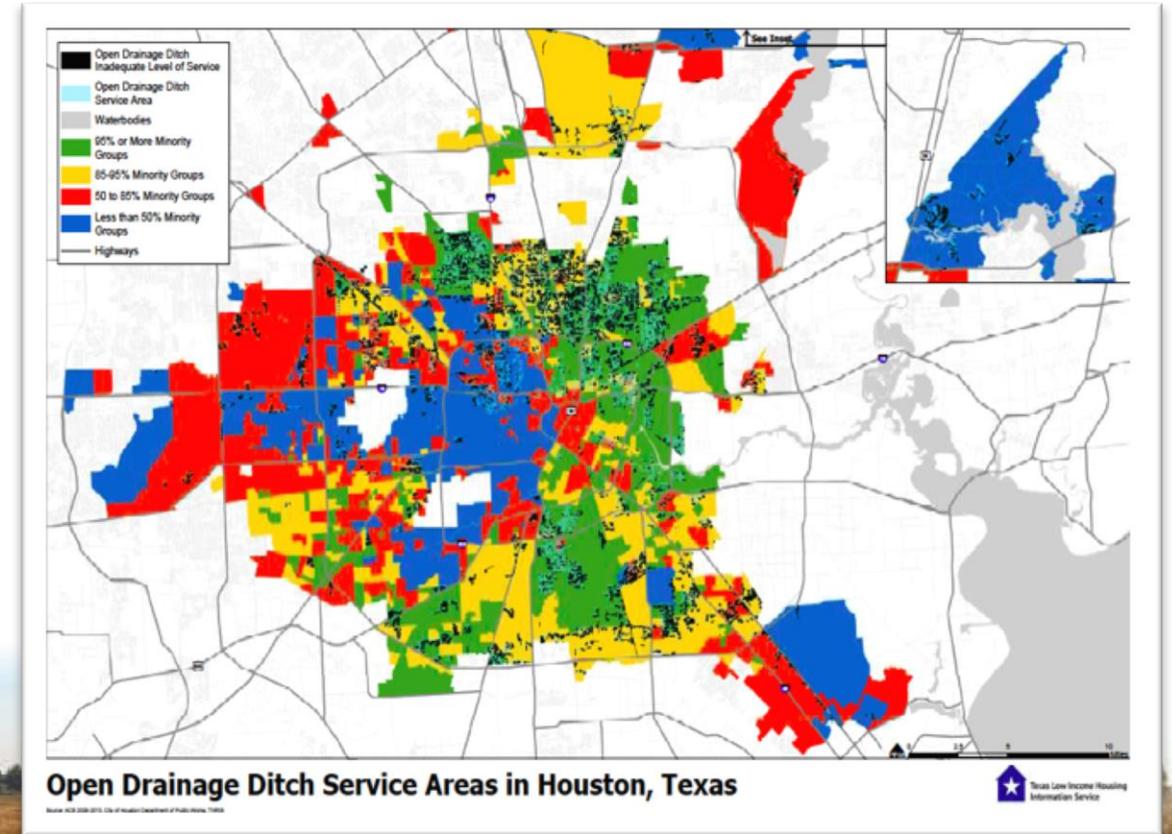
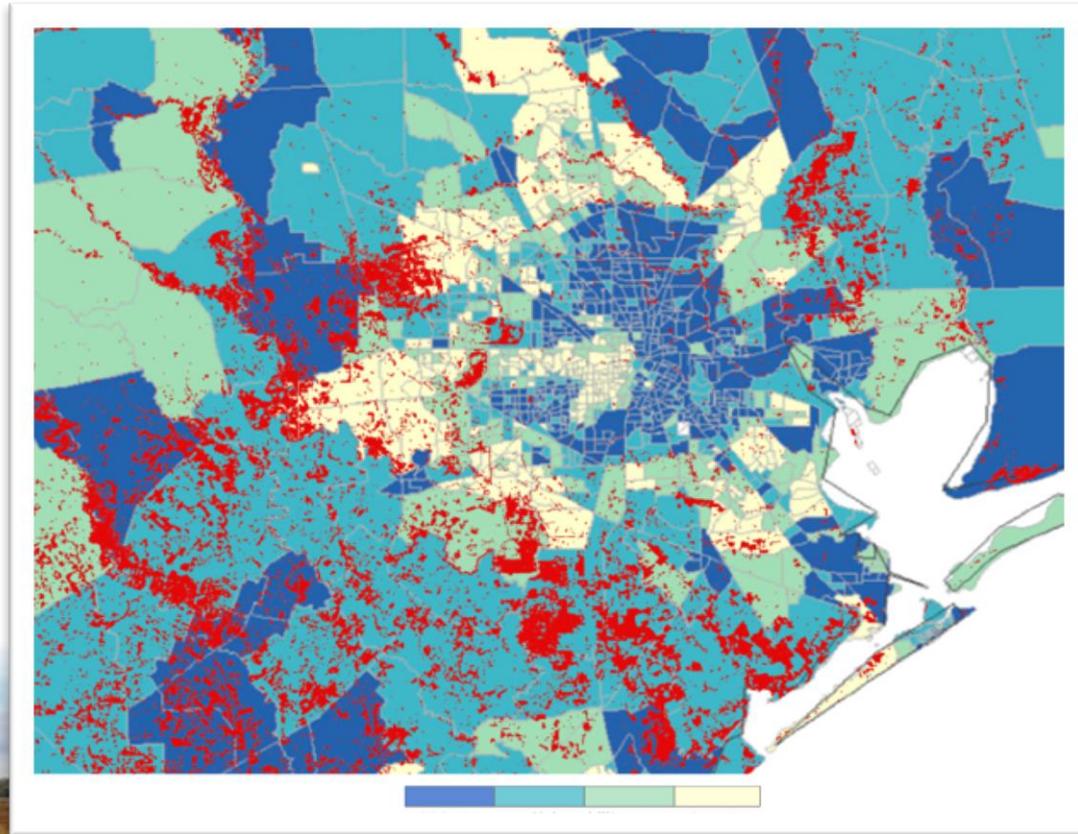
Acquire land along bayous and creeks where watersheds remain undeveloped – *Greater Houston Flood Mitigation Consortium*

Design a green infrastructure network as a strategically planned and managed network of natural lands, working landscapes, and other open spaces that conserve ecosystem functions and provide additional benefits to human populations – *The Conservation Fund*



Equity Considerations

Under TAC 361.38, “evaluations of potentially feasible FMS and FMPs shall include. . . and be based on. . . an *equitable comparison* between consistent assessment of all FMSs and FMPs that the RFBGs determine to be potentially feasible.”



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Item 17:

Presentation of 2021 Planning

Group key dates and deadlines

a. Upcoming planning schedule milestones

b. The next San Jacinto RFPG meeting will be on May 13, 2021 at 9:00 am.



Item 18:

Reminder regarding Planning
Group member training on Public
Information Act and Open Meetings
Act



Item 19:

Consider agenda items for next meeting



Item 20:

Public comments – limit 3 minutes
per person



Item 21:
Adjourn